ON SOME POINTS IN THE ANATOMY OF *SEPIA OFFICINALIS*, L.

By R. H. Burne, B.A.,
Assistant in the Museum of the Royal College of Surgeons of England.

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I. The Relation of the Peritoneal Sac to the Body-Cavity.

Grobben,[1] in a paper on the renal and reproductive organs of the Cephalopoda, calls attention to a curious peritoneal sac that surrounds the middle region of the genital duct of the male cuttlefish (*Sepia officinalis*, L.). It is true that Brock[2] was the original discoverer of this sac, but his description of it is so short that in reality Grobben is the chief source of our knowledge upon the subject.

The sac encloses the vesicula seminalis, prostate, and cæcum, and from near its anterior end sends forth a prolongation that encircles the apex of Needham's pouch in a loose spiral; it is an entirely closed chamber, with the exception of a communication with the genital duct by means of a short tube lying between the vesicula seminalis and prostate.

Grobben suggests, with regard to the morphology of this peritoneal sac, that it is a portion of the body-cavity pinched off from the rest, but connected with the exterior by the above-mentioned tube, which he regards as the remains of a second vas deferens. He holds this view for the two following reasons:—(1) The similarity of the epithelium lining the sac to that of the general body-cavity, and (2) the presence in *Philonexis carenæ*[3] of two vasa deferentia, both of which open into the genital capsule (body-cavity).

In several male specimens of *Sepia officinalis*, L.,[4] that I have dissected, the general anatomical features of the sac and surrounding parts are exactly as described by Grobben, with the addition, however, of what appears to be a very distinct rudiment of the lost connection between the peritoneal sac and the body-cavity. The rudiment has the following features:—Upon the left side of the body, close behind the fold that imperfectly separates the pericardial from the genital division of the body-cavity, there arises from the latter a forwardly directed peritoneal funnel. In form it resembles a cone some 10 mm.

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[1] Grobben, "Morphologische Studien über den Harn und Geschlechtsapparat der Cephalopoden": Arb. Inst. Wien, tom. v (1884), p. 14.

[2] Brock, "Ueber die Geschlechtsorgane der Cephalopoden": Zeitschr. Wiss. Zool., Bd. xxxii (1879), p. 16.

[3] According to W. E. Hoyle, this is a synonym for *Ocythoë tuberculata*, Raf.: Proc. Royal Phys. Soc. Edinb., vol. ix (1888), p. 213.

[4] The property of the Royal College of Surgeons of England: No. 2,371, B, Phys. Series.

in height, prolonged at its apex into a narrow tube 5 mm. long by ·5 mm. broad. The funnel lies close to the inner side of the peritoneal sac, with its apex and tubular prolongation upon the wall of Needham's pouch; the blind extremity of the tube is directed towards the anterior (ventral) end of the sac, but gradually dwindles away without reaching it.

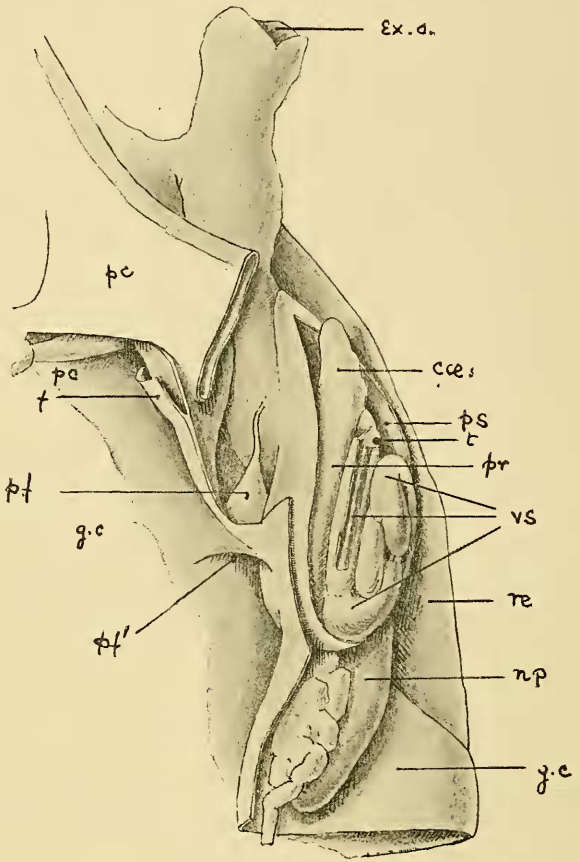

Fig. I.

Fig. I.—Genital duct and part of the body-cavity of a male Cuttlefish (*Sepia officinalis*, L.). ×1½.

cæ. cæcum. *ex.o.* external orifice of genital duct. *f.* fold between pericardium and genital capsule. *g.c.* genital capsule. *n.p.* apex of Needham's pouch. *pc.* pericardium. *p.f.* peritoneal funnel. *p.f'.* its opening from the genital capsule. *pr.* prostate. *p.s.* peritoneal sac. *r.e.* dorsal (anterior) renal sac. *t.* opening of tube from peritoneal sac into genital duct. *v.s.* vesicula seminalis.

The position and general appearance of this funnel (present only in the male) seem clearly to indicate that it is the remains of a former channel of communication between the peritoneal sac surrounding the genital duct and the body-cavity, thus supplying an additional argument in favour of the cælomic origin of the sac.

II. On the Presence of a Series of Cartilages in the Branchiæ.

The gill of a cuttlefish [1] is an elongated structure, tapering towards its apex and triangular in cross-section; it is attached to the inner surface of the mantle along the greater part of one of its sides, and covered on the other two by the closely-set branchial lamellæ arranged parallel to one another at right angles to its long axis.

In transverse section (Fig. II) it will be seen that as the lamellæ of opposite sides approach the base of attachment of the gill, they become

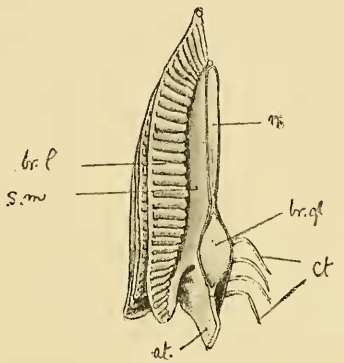

Fig. II.

Fig. II.—Portion of the gill of *Sepia officinalis*, L., seen in transverse section. × 1½. The branchial lamellæ and their supporting membranes have been removed on the right side.

at. membrane for attachment of gill to mantle. *br.gl.* branchial gland. *br.l.* branchial lamellæ. *ct.* cartilages. *m.* muscle. *s.m.* supporting membrane of the branchial lamellæ.

pointed and widely separated from each other; the space between them is mainly occupied by a large glandular mass (the branchial gland) running from end to end of the gill. The inner margins of the lamellæ are not, however, attached directly to this; but indirectly, by means of an intervening membrane (the supporting membrane).

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[1] The gill of the Cephalopoda has been very fully described by Joubin, Arch. Zool. Exper., tom. iii (1885), p. 75.

Two sides of this membrane are obviously attached to the branchial lamella and branchial gland respectively, but the third side, that extending from the branchial gland to the tip of the lamella parallel to the mantle surface, is free.

The skeleton with which this note is concerned consists of a series of slender rods of cartilage (one to each gill lamella), standing out from the branchial gland and stiffening the free edge of each supporting membrane. Each rod tapers gradually from its base, which is embedded in the covering of the branchial gland, till it reaches the tip of the lamella; it is accompanied on its outer side by a slender muscle. The cartilage of which the rods are composed agrees in structure with that forming the major part of the skeleton, i.e. branching cells embedded in an abundant hyaline matrix.